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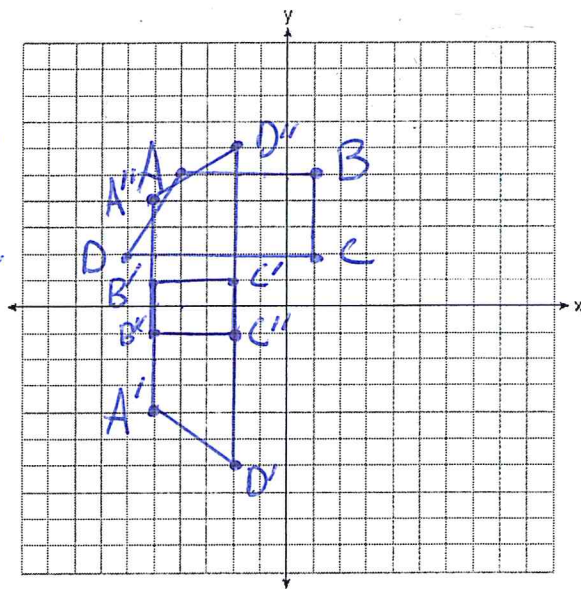
Date \_\_\_\_\_  
Geometry

## Composition of Transformations

1. The coordinates of trapezoid  $ABCD$  are  $A(-4, 5)$ ,  $B(1, 5)$ ,  $C(1, 2)$ , and  $D(-6, 2)$ . Trapezoid  $A''B''C''D''$  is the image after a rotation of  $90^\circ$  followed by a reflection in the  $x$  axis. State the coordinates of trapezoid  $A''B''C''D''$ .

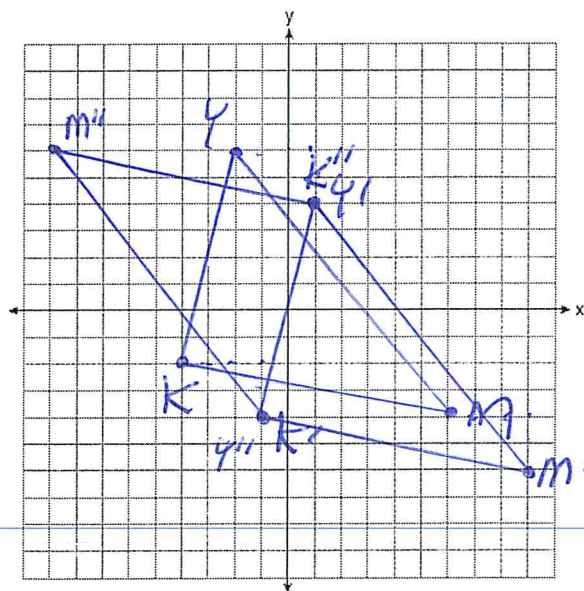
$A''(-5, 4)$   
 $B''(-5, -1)$   
 $C''(-2, -1)$   
 $D''(-2, 6)$

$A'(-5, 4)$   
 $B'(-5, 1)$   
 $C'(-2, 1)$   
 $D'(-2, 6)$



2. Triangle  $MKY$  has vertices  $M(6, -4)$ ,  $K(-4, -2)$ , and  $Y(-2, 6)$ . Graph the image of  $\triangle MKY$  after a translation 3 units right and 2 units down followed by a rotation of  $180^\circ$  and label it  $\triangle M'K'Y'$ .

$(h'-1) \parallel h$   
 $(h'-1) \parallel k$   
 $(h'-1) \parallel l$

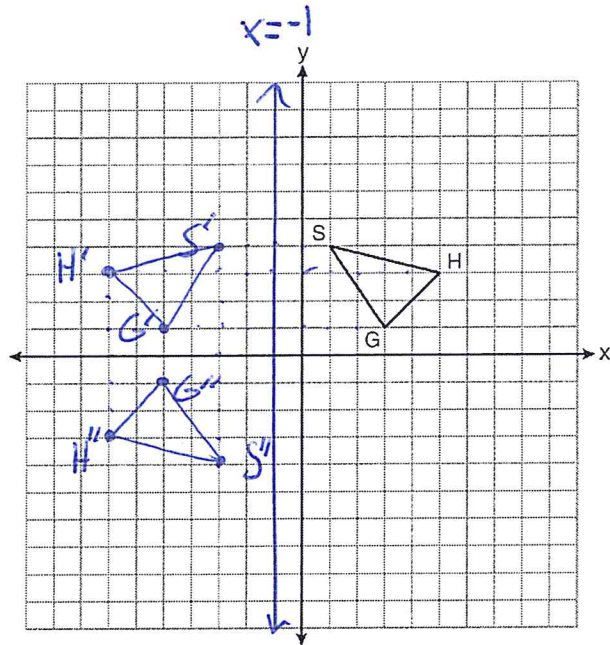


3. As shown on the set of axes below,  $\triangle GHS$  has vertices  $G(3, 1)$ ,  $H(5, 3)$ , and  $S(1, 4)$ . Graph and state the coordinates of  $\triangle G''H''S''$ , the image of  $\triangle GHS$  after a reflection over the line  $x = -1$  followed by a reflection over the  $x$  axis.

$$G''(-5, -1)$$

$$H''(-7, -3)$$

$$S''(-3, -4)$$



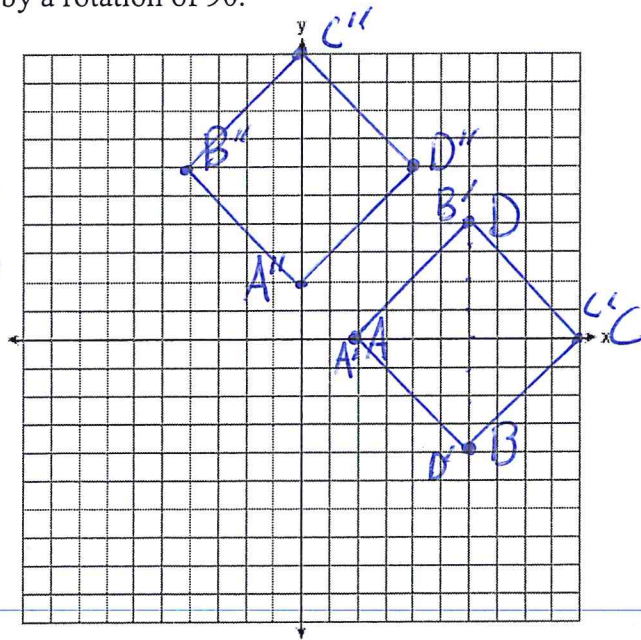
4. The coordinates of the vertices of quadrilateral ABCD are  $A(2, 0)$ ,  $B(6, -4)$ ,  $C(10, 0)$ , and  $D(6, 4)$ . Graph and state the coordinates of quadrilateral  $A''B''C''D''$ , the image of quadrilateral ABCD after reflection in the  $x$  axis followed by a rotation of  $90^\circ$ .

$$A''(0, 2)$$

$$B''(-4, 6)$$

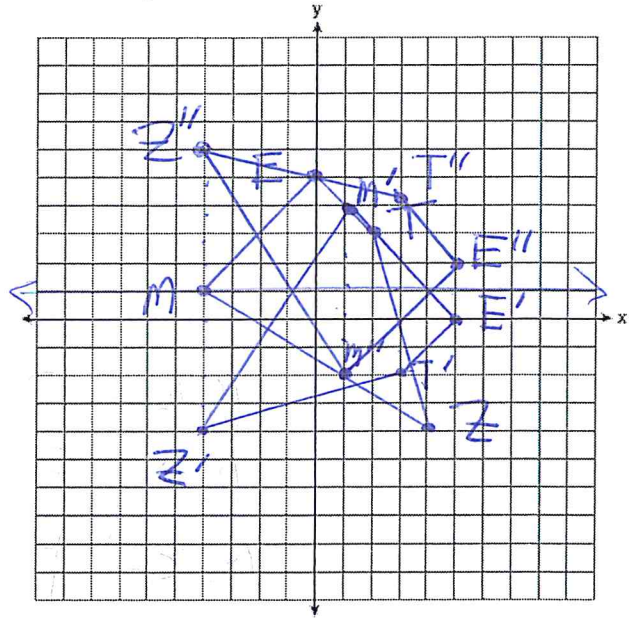
$$C''(0, 10)$$

$$D''(4, 6)$$



5. The coordinates of the vertices of quadrilateral METZ are M(-4,1), E(0,5), T(2,3), and Z(4,-4). Graph and state the coordinates of quadrilateral M'E'T'Z', the image of quadrilateral METZ after a rotation of 270 followed by a reflection over the line  $y = 1$ .

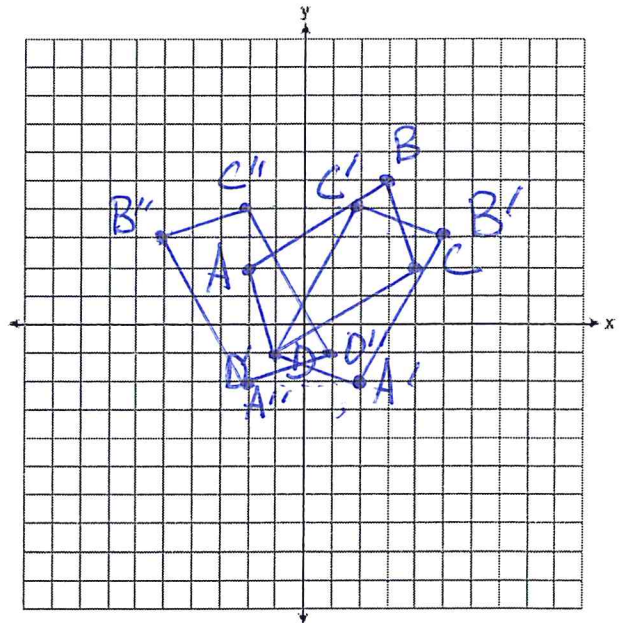
$$\begin{aligned}
 M(-4,1) &\xrightarrow{\text{rotation}} (1,4) \xrightarrow{\text{reflection}} (1,-2) \\
 E(0,5) &\rightarrow (5,0) \rightarrow (5,2) \\
 T(2,3) &\rightarrow (3,-2) \rightarrow (3,4) \\
 Z(4,-4) &\rightarrow (-4,-4) \rightarrow (-4,6)
 \end{aligned}$$



→ Switch the points

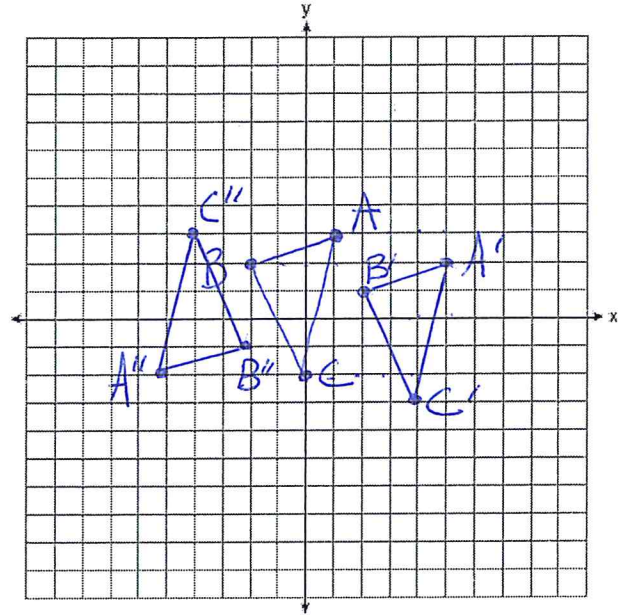
6. The coordinates of the vertices of parallelogram ABCD are A(-2,2), B(3,5), C(4,2), and D(-1,-1). State the coordinates of the vertices of parallelogram A''B''C''D'' that result from a reflection over the line  $y = x$  followed by a reflection in the y axis.

$$\begin{aligned}
 A(-2,2) &\xrightarrow{\text{reflect } y=x} (2,2) \xrightarrow{\text{reflect } y\text{-axis}} (-2,-2) \\
 B(3,5) &\rightarrow (5,3) \rightarrow (-5,3) \\
 C(4,2) &\rightarrow (2,4) \rightarrow (-2,4) \\
 D(-1,-1) &\rightarrow (-1,-1) \rightarrow (1,-1)
 \end{aligned}$$



7. The coordinates of the vertices of  $\triangle ABC$  are  $A(1, 3)$ ,  $B(-2, 2)$  and  $C(0, -2)$ . On the grid below, graph and label  $\triangle A''B''C''$ , the result of a translation 4 to the right and one down followed by a rotation of  $180^\circ$ . State the coordinates of  $A''$ ,  $B''$ , and  $C''$ .

$(3, -1) \text{ ,, } C''$   
 $(1, -2) \text{ ,, } B''$   
 $(-2, -5) \text{ ,, } A''$



8. In the diagram below,  $\triangle ABC$  has coordinates  $A(1, 1)$ ,  $B(4, 1)$ , and  $C(4, 5)$ . Graph and label  $\triangle A''B''C''$ , the image of  $\triangle ABC$  after the translation five units to the right and two units up followed by the reflection over the line  $y = 0$ .

